

Claims

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1. A magnetic recording medium, comprising:
a non-magnetic substrate,
a B2-structured ruthenium-aluminum-containing underlayer comprising a
(200) crystallographic orientation; and
a magnetic layer comprising a Co(11.0) crystallographic orientation.

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2. The magnetic recording medium of claim 1, wherein the non-magnetic
substrate is mechanically textured and OR-Mrt is more than about 1.05.

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3. The magnetic recording medium of claim 1, wherein the ruthenium-
aluminum-containing underlayer comprises RuAl and Ru is in a range from about 45
to about 51.5 atomic percent.

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4. The magnetic recording medium of claim 1, further comprising an
oxidized NiP film on the non-magnetic substrate, wherein the non-magnetic substrate
is non-metallic.

5. The magnetic recording medium of claim 1, wherein the non-magnetic
substrate is an Al-alloy substrate comprising electrolessly plated NiP, wherein the
surface of the NiP film is oxidized.

6. The magnetic recording medium of claim 1, further comprising a chromium-containing second underlayer disposed between the ruthenium-aluminum-containing underlayer and the magnetic layer.

7. The magnetic recording medium of claim 4, wherein the oxidized NiP film comprises a phosphorus content in a range of about 12 to about 50 atomic percent and an oxygen content in a range of about 0.5 to about 50 atomic percent in the top 50 Å of the oxidized NiP film.

8. The magnetic recording medium of claim 7, wherein the oxidized NiP film has a thickness of about 50-200,000 Å.

9. The magnetic recording medium of claim 1, wherein the magnetic layer comprises an alloy material selected from the group consisting of CoCrPtB, CoCrPtBTa, CoCrPtBTaNb, CoCrPt, CoCrNi, CoCrPtTa, CoCrPtTa Nb, and CoCrTa.

10. The magnetic recording medium of claim 1, wherein the ruthenium-aluminum-containing underlayer has a thickness of about 50-800 Å.

11. A method of making a magnetic recording medium comprising:

providing a non-magnetic substrate;

depositing a B-2 structured ruthenium-aluminum-containing underlayer comprising a (200) crystallographic orientation on the non-magnetic substrate; and

depositing a magnetic layer comprising a Co(11.0) crystallographic orientation on the B-2 structured ruthenium-aluminum-containing underlayer.

12. The method of claim 11, wherein the ruthenium-aluminum underlayer comprises from about 45 to about 51.5 atomic percent ruthenium.

13. The method of claim 11, further comprising depositing a chromium-containing second underlayer between the RuAl-containing underlayer and the magnetic layer.

14. The method of claim 11, further comprising depositing a CoCr-containing intermediate layer between the RuAl-containing underlayer and the magnetic layer

15. The method of claim 11, wherein the magnetic layer comprises an alloy material selected from the group consisting of CoCrPtB, CoCrPtBTa, CoCrPtBTaNb, CoCrPt, CoCrNi, CoCrPtTa, CoCrPtTa Nb, and CoCrTa.

16. The method of claim 11, wherein the ruthenium-aluminum-containing underlayer has a thickness of about 50Å to about 800Å.

17. The method of claim 11, further comprising sputter-depositing an oxidized NiP layer on the non-magnetic substrate.

18. The method of claim 11, further comprising electroless plating of the non-magnetic substrate with a NiP layer, then oxidizing and mechanical texturing the surface of the NiP layer, wherein the non-magnetic substrate is an Al-alloy substrate.

19. The method of claim 17, wherein the oxidized NiP layer comprises a phosphorous content of from about 12 at.% to about 50 at.%, and an oxygen content of from about 0.5 at.% to about 50 at.% in the top 50Å of the oxidized NiP layer.

20. A magnetic recording medium comprising:
a magnetic layer; and
means for promoting a Co(11.0) crystallographic orientation in the magnetic layer.